**The Problem with Real-World Problems**

by Sarah Theule Lubienski

Many educators argue that children must go beyond memorizing rules—they need to know when and how to apply the rules in real-world situations. I agree. Many also argue that realistic problems can serve as a powerful motivator in the mathematics classroom. Again, I agree. Some educators go on to conclude that the curriculum should consist of real-world problems because students will naturally learn mathematics by solving such problems. Here, I worry.

One way in which real-world problems become the center of the curriculum is through integrating several subjects—mathematics, social studies, science, and so on. This attempt at integration usually begins with a theme such as rain forests, which then drives the choice of topics—for example, measuring rainfall or counting rain-forest animals, and so on. Instead of a careful development of mathematical concepts that build on one another, the mathematics curriculum becomes a potpourri of problems that are loosely held together by the rain-forest theme. Some teachers use this approach in addition to the regular mathematics curriculum to allow students to apply what they have learned through more traditional instructional methods. Others would argue that this "dessert" approach misses an essential point of current reforms (Lubienski 1999). But when the integrated approach becomes the staple of mathematics instruction and is implemented so that a single mathematical idea or strand, for example, measurement or probability, is rarely given sustained focus, then students have difficulty building deep mathematical understandings.

A second scenario places the mathematics more centrally. The major mathematical ideas to be taught are first identified and then embedded in problem situations designed to teach those ideas. For many children, this approach often works well. But after studying students' experiences with learning mathematics in this way, I became concerned that some students—especially those from lower socioeconomic backgrounds—tended to solve the problems in ways that caused them to miss the intended mathematical point (Lubienski 2000). For example, more students from lower socioeconomic backgrounds solved a pizza-sharing problem without using fractions; these students instead became concerned with multiple real-world variables, such as the different time schedules and appetites of those sharing the pizza. The students from higher socioeconomic backgrounds were more likely to ignore real-world factors and solve the problem by using fractions, thereby reaping the intended mathematical benefits. Although this study involved too few children to generalize to all children, it does indicate that teachers need to carefully monitor whether children are learning the intended mathematical ideas from real-world problems.

As teachers, we cannot assume that a real-world problem will "carry the mathematics." Through careful analyses of our students' writing and talking, we must continuously assess what children are learning, including whether they understand the mathematics in such a way that they can transfer their understanding from one situation to another.

**References**  
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Lubienski, Sarah Theule. "Problem Solving as a Means toward 'Mathematics for All': An Exploratory Look through a Class Lens." *Journal for Research in Mathematics Education* 31 (July 2000): 454–82.

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